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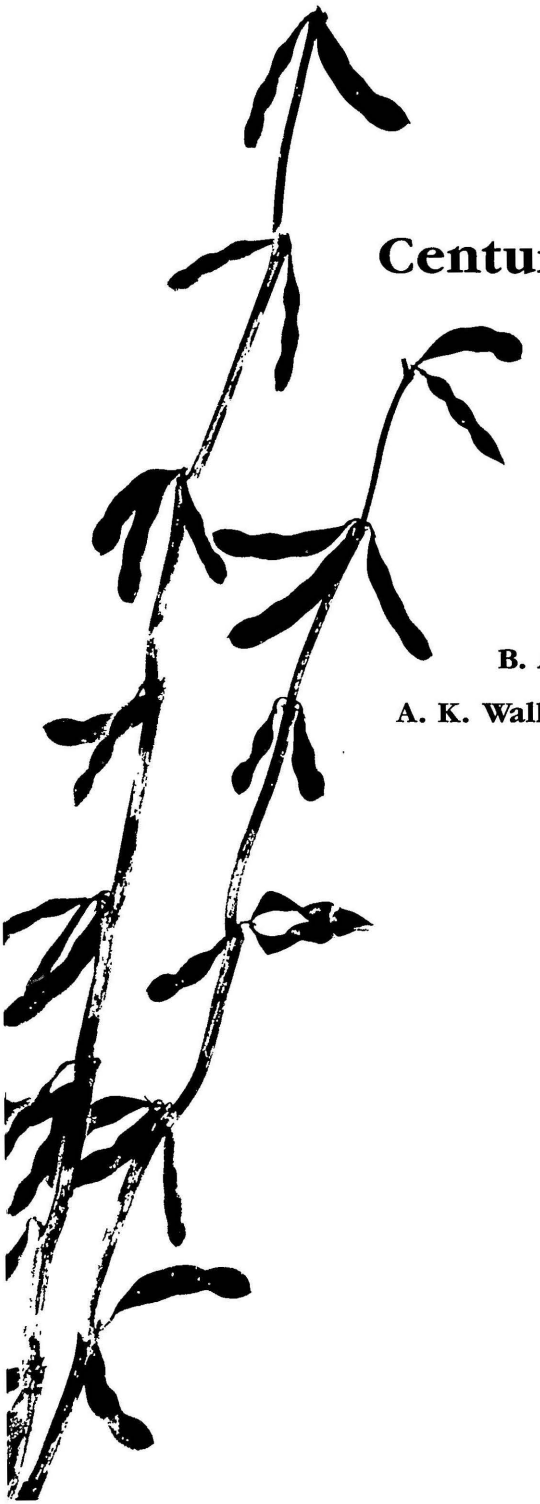

Century 84 Soybeans

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Contents

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CENTURY 84 SOYBEANS

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Century 84 is a new soybean variety which combines early maturity, phytophthora rot resistance (*Phytophthora megasperma* f. sp. *glycinea*), and high yield potential. It was released by The Ohio State University Ohio Agricultural Research and Development Center in 1984. Seed of Century 84 has been available for Ohio farmers since the spring of 1986. Performance data for the Century 84 and comparable varieties or commercial strains are presented in Tables 1-6. Century 84 was previously designated HW8185 in OARDC Agronomy Department Series No. 225, 1984.

Origin

Century 84 originated as the bulk of two BC_4F_2 populations from the cross Century[5] x L24. L24 is very closely related to Williams 82 which was L24A (L24A is the bulk of six BC_6F_2 lines, and Williams 82 is the bulk of four of those six BC_6F_2 lines). Century and Williams 82 are public soybean varieties grown in the Midwest U.S. Century 84 is similar to Century, but has the Rps_1-k gene for phytophthora rot resistance transferred from L24.

The four backcrosses to Century took place from 1979 to 1981 and tests for resistance to phytophthora rot were conducted for each generation. Eighteen resistant BC_4F_2-derived lines were increased at the Isabela Substation of the Puerto Rico Agricultural Experiment Station from November 1981 to February 1982. In 1982, a bulk of these lines was tested under the designation HW8185 in regional tests (Uniform Soybean Tests, Northern States) and the individual 18 lines were tested for yield in Ohio. The lines Century BC_4F_2-16 and -17 were bulked because they were similar in appearance and performance. This bulk was also tested in 1983 as HW8185 in the Uniform Soybean Tests, Northern States and in Ohio trials. Eighty-four units (50 lb) of breeder seed of HW8185 were produced in 1983. In the spring of 1984, 25 units of breeder seed were used to seed 29 acres of the foundation generation by the Ohio Foundation Seeds, Inc., and the rest was shared with the foundation seed organizations in Illinois, Indiana, Iowa, Nebraska, South Dakota and Wisconsin. Century 84 was cooperatively released by experiment stations in Ohio, Illinois, Indiana and Iowa on August 1, 1984.

Agronomic Performance

The bulk of 18 BC_4F_2 lines was evaluated in 1982 at 24 locations in the Uniform Soybean Tests, Northern States from New Jersey in the east to Nebraska in the west, and from Michigan in the north, south as far as Kansas. The repurified line (bulk of two BC_4F_2 lines) which became Century 84 was entered into regional and state trials in 1983. Since then

Century 84 has been continously entered in the Ohio Soybean Breeding Tests; the Uniform Soybean Tests, Northern States; and the Ohio Soybean Trials (Tables 1-6).

The release of a new soybean variety is usually supported by about four years' test data. However, backcross cultivars like Century 84 recover more than 95% of the genes from the recurrent parent and the transferred gene from the donor parent. Thus, testing need only verify that performance has not deteriorated relative to the recurrent parent.

In five years of breeding trials (1982-86), Century 84 was the highest yielding soybean in Maturity Group II averaging 7% higher than Keller, the only other early indeterminate variety with phytophthora rot resistance (Table 1). It also compared well with NK S1492, one of the best early maturing commercial varieties, and with Williams 82, the best resistant variety which is up to 12 days later in maturity (1982-84). Century 84 performed slightly better relative to other varieties at the Northwestern Branch compared to other locations, probably because phytophthora rot is prevalent there (Table 2). In 1984, phytophthora rot was severe at this site in May and June followed by a drought in July and August. Only Williams 82 was late enough to respond to the rains in late August. Century 84 performed better than Keller (the other early resistant variety) and was far superior to Elgin, Amcor or NK S1492.

In three years of regional tests (1982-84), Century 84 performed similarly to Century and the later-maturing Pella in yield (Table 3). The varieties Elgin and Hack were up to 2 bu/a higher in yield than Century 84 in three years of these tests (1982-84) which had a little evident phytophthora rot. In 1985-86, Century 84 and Elgin were equal in yield and average over five years (1982-86) Elgin had a 1 bu/a yield advantage. Elgin is susceptible to phytophthora rot and performs poorly under severe disease pressure. Ohio did not participate in release of Hack because of its extreme susceptibility.

Century 84, and other public varieties and commercial strains of soybeans were evaluated in the Ohio Soybean Trials (J.E. Beuerlein, and A. F. Schmitthenner, OARDC, Agronomy Series 212, 1985 to 1987). Century 84 has shown superior performance relative to Maturity Group II varieties and strains including Elgin (Table 4). It has comparable performance to commercial soybean strains FFR 226 and V295 and the public varieties Zane and Pella which are 3 to 4 days later in maturity.

Characteristics

Century 84 has purple flowers, tawny pubescence, brown pods at maturity, and dull yellow seed with black hila. It is a mid-Maturity Group II variety (Table 5) which is early for much of Ohio. Thus its height and

Table 1. Comparative yields (bu/a) for Century 84 and other soybean varieties (ranked by matrurity), from Ohio Advanced Line Tests 1982 -1986.

Variety	1982 4 tests	1983 3 tests	1984 3 tests	1985 3 tests	1986 6 tests	Average 1982-1984 10 tests	Average 1982-1986 19 tests
Vickery	43	40	44[1]	36	45	42	41
NK S1492	47	40	45	--	--	44	--
Beeson 80	46	40	41	43	--	42	--
Keller	45	41	42	44	44	43	43
Elgin	44	39	48	45	43	44	44
Century 84	45	42	49	45	48	46	46
Century	45	42	48	--	--	45	--
Amcor	46	40	50	43	45	45	45
Gnome 85[2]	39	39	43	48	46	41	46
Williams 82	49	42	49	--	--	47	--

[1] Yield of Vickery estimated for 1984 based on relative performance in other years.

[2] Gnome 85, a phytophthora rot resistant backcross variety derived from Gnome, was substitued for Gnome in the years 1984 to 1986, inclusive, and the 5-year mean.

Table 2. Comparative yields (bu/a) of Century 84 and other soybean varieties (ranked by maturity), by locations in the Ohio Advanced Line Tests, 1982-1986.

	OARDC Wooster		Northwestern Branch Custar			OFS Croton		Farm Site Auglaize
Variety	1982-84	1982-86	1982-83	1984	1985-86	1982-84	1982-86	1985-86
Vickery	40	38	43	--	40	40	41	--
NK S1492	41	--	42	14	--	47	--	--
Beeson 80	41	--	45	31	--	43	--	--
Keller	39	39	44	39	45	45	47	46
Elgin	42	38	44	13	39	46	47	--
Century 84	42	41	46	40	43	47	48	54
Century	43	--	42	19	--	48	--	--
Amcor	43	42	42	11	39	48	48	55
Gnome 85[1]	42	42	35	29	51	47	48	--
Williams 82	41	--	49	47	--	--	--	--

[1] Gnome 85, a phytophthora rot resistant variety derived from Gnome, was substituted for Gnome in the years 1984 to 1986, inclusive.

Table 3. Comparative yield (bu/a) for Century 84 and other soybean varieties (ranked by maturity) from the Uniform Soybean Tests, Northern States, 1982-1986.

Variety	1982 24 tests	1983 20 tests	1984 20 tests	1985 21 tests	1986 21 tests	Average 1982-84 64 tests	Average 1985-86 42 tests	Average 1982-86 106 tests
Hardin	--	44	45	--	49	--	--	--
BSR201	46	44	43	--	--	45	--	--
Elgin	48	46	46	47	49	47	48	47
Hack	49	47	44	--	--	47	--	--
Century 84	48	45	43	45	50	45	48	46
Century	47	45	45	--	--	46	--	--
Preston	--	47	47	--	49	--	--	--
Gnome 85[1]	45	40	41	44	--	42	--	--
Zane	--	--	--	48	51	--	50	--
Pella	48	45	44	--	--	46	--	--

[1] Gnome 85, a phytophthora rot resistant variety derived from Gnome, was sustituted for Gnome in 1984 and 1985.

Table 4. Comparative yield (bu/a) for Century 84 and other soybean strains (in maturity order) from the Ohio Soybean Trials, 1984-1986.

	Western Branch S. Charleston		West Central Auglaize		Northwestern Branch Custar		North Central[2] Vickery	Average		
Strain	1983-5	1984-6	1983-5	1984-6	1983-5	1984-6	1983-4,1986	1983-5	1984-6	1983-6
Vickery	58	58	47	55	47	39	35	51	50	51
Beeson 80	61	63	47	53	51	56	34	53	54	53
Keller	57	57	47	51	48	55	39	51	54	53
AP240	59	--	--	--	50	--	35	--	--	--
Elgin	--	62	--	58	--	57	35	--	59	--
Century 84	59	61	49	57	52	63	37	53	60	57
TS 222	--	60	--	--	--	61	--	--	--	--
Amcor	--	59	--	56	--	63	37	--	--	--
FFR226	61	60	52	57	54	61	--	55	59	57
Zane	59	60	52	56	53	59	37	54	59	57
V295	67	64	--	--	53	60	36	--	--	--
Pella	61	61	56	55	53	60	34	57	59	58

[1] Entries within 5 days maturity of Century 84 with at least three locations were included. Data taken from OARDC Agronomy Series 212, J. E. Beuerlein and A. F. Schmitthenner, 1985 to 1987.

[2] North Central data are not included in overall means.

Table 5. Comparative growth data for Century 84 and other soybean varieties (in maturity order) from the Ohio Advanced Line Test and the Uniform Soybean Tests, Northern States, 1982-86.

Variety	Relative Maturity[1]		Lodging Score[2]		Height (in.)	
	Regional Tests	Ohio Tests	Regional Tests	Ohio Tests	Regional Tests	Ohio Tests
Hardin	1.9	2.0	1.9	1.5	34	28
Vickery	--	2.0	--	2.5	--	34
BSR201	2.3	--	2.1	--	33	--
Elgin	2.4	2.3	1.8	1.7	32	29
Hack	2.5	2.3	1.3	1.6	32	31
Century 84	2.6	2.6	2.1	1.6	34	32
Century	2.7	2.7	1.4	1.7	35	33
Preston	2.7	--	1.5	--	36	--
Amcor	--	2.8	--	2.4	--	37
Gnome 85[3]	3.1	3.1	1.9	1.5	23	22
Zane	3.0	3.0	1.9	1.7	37	33
Pella	3.0	3.1	1.6	1.6	37	34
Williams 82	--	3.9	--	1.9	--	38

1 Relative maturity scores are composed of whole digit maturity group followed by a decimal which relates to placement in maturity group. Higher scores indicate later maturity.

2 Lodging scores are based on a 1.0 (100% erect) to 5.0 (100% prostrate) scale.

3 Gnome 85, a phytophthora rot resistant variety derived from Gnome, was substituted for Gnome in 1984 and 1985.

Table 6. Comparative phytophthora rot and seed quality data for Century 84 and other soybean varieties (in maturity order) from the Uniform Soybean Tests, Northern States, 1982-86.

Variety	Phytophthora Rot[1] Northwestern Branch 1984 Yield (bu/a)	1984 Stand (score)	1984 Tolerance (score)	1985-86 Tolerance (score)	Resistance	Seed[2,3] Quality Score 37 tests	Seed[3] Size (gm/100) 39 tests	Composition[3] Protein (%) 7 tests	Composition[3] Oil (%) 7 tests
Hardin	14	4.2	3.9	--	S	1.9	15	39	22
BSR201	38	2.1	3.3	--	R	1.7	15	41	20
Elgin	8	4.9	4.3	3.5	S	1.9	17	38	22
Hack	12	4.6	3.3	--	S	1.8	17	39	22
Century 84	40	2.3	2.5	2.8	R	1.9	18	42	20
Century	26	3.4	3.5	--	S	1.8	18	41	21
Preston	15	3.9	3.1	--	S	2.2	18	40	21
Gnome	8	4.7	3.3	--	S	1.7	15	41	21
Gnome 85	39	1.7	2.4	--	R	1.9	15	42	21
Zane	27	3.9	2.8	3.2	S	1.9	18	39	22
Pella	11	4.7	2.8	--	S	2.0	19	39	22

1 Phytophthora rot was severe at Northwestern Branch in 1984 severely affecting stands and yield. Stand and tolerance scores are based on a 1.0 (100% survival and vigor) to 5.0 (100% mortalilty) scale, a 3.0 score is a useable level of tolerance and resistant lines usually score 2.8 or lower.

2 Seed quality scores are based on a 1 (perfect yellow seed coat, freedom from disease and insect damage) to 5 (100% mottled or damaged seed) scale.

3 Values for Century 84 and Elgin are true means, other values are adjusted means based on at least the indicated number of tests.

lodging are lower in Ohio than in regional tests which include locations where it is a full-season variety. It is best adapted to approximately 41^0 to 43^0 N. Lat. It differs from Century in being 1 inch shorter, resistant to prevalent races of phytophthora rot, and in having 1% higher protein and 1% lower oil content in the seed (Table 6). In spite of above average seed size, Century 84 has only an average ability to emerge. It has very high shattering resistance, average iron-chlorosis resistance, and one of the highest protein contents in public varieties.

Disease Resistance

Century 84 is resistant to at least 22 of the 25 known races of *Phytophthora megasperma* f. sp. *glycinea* Drech. (Kuan & Erwin) since it has Rps_1-k from Kingwa via L24 and apparently, Rps_7 from Harosoy via Century. This resistance can save the farmer the cost of replanting a decimated stand or can give him 30 bu/A higher yield relative to susceptible varieties such as Elgin and Hack when the disease is severe. It is comparable in yield to Williams 82, the best previous resistant variety, but is up to 12 days earlier to mature. Century 84 is moderately resistant to purple seed stain [caused by *Cercospora kikuchii* (T. Matsu & Tomoyasan) Chupp]. It is, however, susceptible to frogeye leafspot (caused by *Cercospora sojina* Hara), brown stem rot [caused by *Phialophora gregata* (Allington & Chamberlain) W. Gams] and to soybean mosaic virus.

Availability

Breeder seed of Century 84 was distributed to foundation seed organizations in Illinois, Indiana, Iowa, Nebraska, Ohio, South Dakota and Wisconsin for planting in 1984. Certified seed has been available in limited quantities for commercial growers since 1986 and supplies should be adquate for seeding in the spring of 1988. Breeder seed is being maintained by the Ohio Agricultural Research and Development Center, Wooster, Ohio 44691. Century 84 has variety registration number 188 with the Crop Science Society of America and has been granted a Plant Variety Protection Certificate number 8500058 with Title V protection, restricting its production as a named variety to classes of certified seed.

Hatch Act Centennial
1887-1987

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